

AMENDMENT TO THE CLAIMS

1. (currently amended) A computer readable medium including instructions readable by a computer, which when implemented, cause the computer to detect a significant event in measurement data comprising the steps of:

receiving measurements as a function of at least one variable;  
generating values from associated with the received  
measurements, the values indicative of multiples of a  
standard deviation;  
selecting a lower bound of the values based on a first selected  
multiple of the standard deviation,  
selecting an upper bound of the values based on a second  
selected multiple of the standard deviation; and  
calculating the significant event based on the lower bound and  
the upper bound as a function of the values.

2. (currently amended) The computer readable medium of claim 1, wherein the significant event is a point of engagement, wherein at  
the lower bound, an indication of the point of engagement has not  
occurred, and wherein at the upper bound the indication of the point  
of engagement has occurred.

3. (original) The computer readable medium of claim 2, wherein the point of engagement is of an indenter in an indenter test system.

4. (original) The computer readable medium of claim 2, wherein the point of engagement is of a tensile test system.

5. (currently amended) The computer readable medium of claim 1, wherein the received measurements are received as a function of  
at least one variable, and further comprising processing the  
received measurements to generate the values.

6. (currently amended) A computer readable medium including instructions readable by a computer, which when implemented, cause the computer to detect a significant event in measurement data comprising the steps of:

generating values associated with received measurements, the values indicative of multiples of a standard deviation; and calculating the significant event as a function of the values, wherein the received measurements are received as a function of at least one variable; and processing the received measurements to generate the values ~~The computer readable medium of claim 5~~, wherein processing the received measurements to generate the values comprises differentiating the received measurements with respect to at least one of the variables to generate a derivative signal scattering about zero as a function of one of the variables.

7. (currently amended) A computer readable medium including instructions readable by a computer, which when implemented, cause the computer to detect a significant event in measurement data comprising the steps of:

generating values associated with received measurements, the values indicative of multiples of a standard deviation; and calculating the significant event as a function of the values, wherein the received measurements are received as a function of at least one variable; and processing the received measurements to generate the values ~~The computer readable medium of claim 5~~, wherein processing the received measurements to generate the values comprises using a compensation function to zero the received measurements.

8. (original) The computer readable medium of claim 6, wherein processing the received measurements to generate the values comprises integrating the derivative signal over a selected increment to generate an integral signal.
9. (original) The computer readable medium of claim 8, wherein processing the received measurements to generate the values comprises calculating the standard deviation from at least part of the integral signal.
10. (original) The computer readable medium of claim 9, and further comprising dividing the integral signal by the standard deviation to generate the values.
11. (original) The computer readable medium of claim 10, wherein calculating the significant event as a function of the values comprises selecting an upper bound based on the generated values.
12. (original) The computer readable medium of claim 11, wherein the upper bound is selected based on an upper threshold correlating to a selected multiple of the standard deviation.
13. (original) The computer readable medium of claim 11, wherein calculating the significant event as a function of the values comprises selecting a lower bound associated with pre-event measurement data.
14. (original) The computer readable medium of claim 13, wherein calculating the significant event as a function of the values comprises using at least one of the upper bound and the lower bound to identify the significant event.

15. (original) The computer readable medium of claim 10, wherein calculating the significant event as a function of the values comprises identifying the significant event as a point correlating to where the integral signal is approximately 2 to 20 times the standard deviation.

16. (original) The computer readable medium of claim 15, wherein calculating the significant event as a function of the values comprises identifying the significant event as a point correlated to where the integral signal is approximately 4 times the standard deviation.

17. (currently amended) A computer readable medium including instructions readable by a computer, which when implemented, cause the computer to detect a significant event in measurement data comprising the steps of:

generating values associated with received measurements, the values indicative of multiples of a standard deviation;  
calculating the significant event as a function of the values; and

processing the received measurements to generate the values, The computer readable medium of claim 5 wherein the received measurements are received as a function of at least one variable, and wherein processing the received measurements to generate the values comprises integrating the received measurements to generate an integral signal.

18. (original) The computer readable medium of claim 17, and further comprising calculating the standard deviation from at least a portion of the integral signal.

19. (original) The computer readable medium of claim 18, and further comprising calculating multiples of the standard deviation by dividing the integral signal by the standard deviation.

20. (currently amended) A computer readable medium including instructions readable by a computer, which when implemented, cause the computer to detect an initial point of engagement between an indenter or tensile tester and a test sample ~~a significant event infrom~~ data measurements comprising the steps of:

receiving a data series indicative of test measurements as a function of a first variable;

generating at least one processed series from the data series;

identifying a first point on the at least one processed series;

identifying a second point on the at least one processed series;

calculating the initial point of engagement ~~significant event as a function of both at least one of~~ the first point and the second point.

21. (original) The computer readable medium of claim 20, and further comprising receiving the data series as a function of at least one other variable.

22. (original) The computer readable medium of claim 21, wherein the test measurements indicate force.

23. (currently amended) ~~The computer readable medium of claim 22A computer readable medium including instructions readable by a computer, which when implemented, cause the computer to detect a significant event in data measurements comprising the steps of:~~

receiving a data series indicative of test measurements as a function of a first variable;  
generating at least one processed series from the data series;  
identifying a first point on the at least one processed series;  
identifying a second point on the at least one processed series;  
calculating the significant event as a function of at least one of the first point and the second point;  
receiving the data series as a function of at least one other variable, wherein the test measurements indicate force, and wherein the first variable comprises displacement and the at least one other variable comprises time.

24. (currently amended) The computer readable medium of claim 21, wherein generating at least one processed series comprises calculating speed of the indenter or tensile tester relative to the test sample taking a first derivative of the received data series to generate a first processed series.

25. (currently amended) The computer readable medium of claim 24A computer readable medium including instructions readable by a computer, which when implemented, cause the computer to detect a significant event in data measurements comprising the steps of:  
receiving a data series indicative of test measurements as a function of a first variable;  
generating at least one processed series from the data series;  
identifying a first point on the at least one processed series;  
identifying a second point on the at least one processed

series;  
calculating the significant event as a function of at least  
one of the first point and the second point;  
receiving the data series as a function of at least one  
other variable, wherein generating at least one  
processed series comprises taking a first derivative of  
the received data series to generate a first processed  
series, and wherein generating at least one processed  
series comprises taking a second derivative of the  
received data series to generate a second processed  
series.

26. (original) The computer readable medium of claim 25, wherein generating at least one processed series comprises integrating the second processed series over a selected period to generate a third processed series.

27. (original) The computer readable medium of claim 26, and further comprising calculating a standard deviation for at least a portion of the third processed series.

28. (original) The computer readable medium of claim 27, wherein generating at least one processed series comprises dividing the third processed series by the standard deviation to generate a fourth processed series.

29. (original) The computer readable medium of claim 28, wherein identifying a second point on the at least one processed series comprises identifying a point on the fourth processed series threshold where the significant event is assumed to have already occurred.

30. (original) The computer readable medium of claim 29, wherein

identifying a second point on the at least one processed series comprises selecting an upper threshold as a function of the standard deviation.

31. (original) The computer readable medium of claim 30, wherein the upper threshold is a multiple of the standard deviation.

32. (original) The computer readable medium of claim 31, wherein the upper threshold is in the range of approximately 10 to 20.

33. (original) The computer readable medium of claim 29, wherein identifying a first point on the at least one processed series comprises identifying a point on the fourth processed series where the significant event is assumed to have not yet occurred.

34. (original) The computer readable medium of claim 33, wherein identifying a first point on the at least one processed series comprises selecting a lower threshold.

35. (original) The computer readable medium of claim 33, wherein the lower threshold is less than 1.

36. (currently amended) ~~The computer readable medium of claim 21 A computer readable medium including instructions readable by a computer, which when implemented, cause the computer to detect a significant event in data measurements comprising the steps of:~~

~~receiving a data series indicative of test measurements as a function of a first variable;~~

~~generating at least one processed series from the data series;~~

~~identifying a first point on the at least one processed series;~~

~~identifying a second point on the at least one processed~~

series;  
calculating the significant event as a function of at least  
one of the first point and the second point;  
receiving the data series as a function of at least one  
other variable, wherein generating at least one  
processed series comprises integrating the received  
data series over a selected increment to generate a  
first processed series.

37. (original) The computer readable medium of claim 36, wherein  
generating at least one processed series further comprises  
calculating a standard deviation for a least a portion of the  
first processed series.

38. (original) The computer readable medium of claim 37, wherein  
generating at least one processed series further comprises  
dividing the first processed series by the standard deviation to  
generate a second processed series.

39. (cancelled) A method of determining a significant event in  
experimental data comprising the steps of:  
generating a data signal indicative of measurements as a  
function of at least one variable;  
processing the data signal to generate a plurality of  
processed signals; and  
determining a significant event based on the processed data  
signals.

40. (currently amended) The method of claim 39A method of  
determining a significant event in experimental data comprising  
the steps of:

generating a data signal indicative of measurements as a  
function of at least one variable;

processing the data signal to generate a plurality of processed signals; and  
determining a significant event based on the processed data signals, wherein the step of processing the data signal to generate a plurality of processed signals comprises taking at least a first derivative of the data signal to generate a processed derivative signal as a function of the at least one variable, and wherein a portion of the processed derivative signal fluctuates about zero as a function of the at least one variable.

41. (original) The method of claim 40, wherein the step of processing the data signal to generate a plurality of processed signals comprises integrating the processed derivative signal to generate a processed integral signal as a function of the at least one variable, the processed integral function comprising integral values.

42. (original) The method of claim 41, wherein the step of processing the data signal to generate a plurality of processed signals comprises:

calculating a standard deviation over a portion of the integral signal; and

dividing the integral values by the standard deviation to generate a signal comprising multiples of the standard deviation.

43. (original) The method of claim 42, wherein determining a significant event based on the processed data signals comprises determining the significant event based on the signal comprising multiples of the standard deviation.

44. (original) The method of claim 43, wherein determining the

significant event based on the signal comprising multiples of the standard deviation comprises:

selecting an upper bound for the significant event;  
selecting a lower bound for the significant event;  
determining the significant event as a point bounded by the upper bound and the lower bound.

45. (original) The method of claim 42, and further comprising determining an uncertainty of the significant event as a function of the upper bound and the lower bound.

46. (original) The method of claim 42, and further comprising determining an uncertainty of the significant event based on the point bounded by the upper bound and the lower bound.

47. (currently amended) The method of claim 39A method of determining a significant event in experimental data comprising the steps of:

generating a data signal indicative of measurements as a function of at least one variable;  
processing the data signal to generate a plurality of processed signals; and  
determining a significant event based on the processed data signals, wherein the step of processing the data signal to generate a plurality of processed signals comprises integrating the data signal to generate a processed integral signal as a function of the at least one variable.

48. (original) A testing system comprising the computer readable medium of claim 1.

49. (original) A testing system comprising the computer readable medium of claim 17.

50. (currently amended) ~~A testing system recording measurements and capable of determining a significant event comprising:~~

~~a testing apparatus generating a data signal indicative of the measurements recorded as a function of at least one variable; and~~

~~a processor coupled to the test apparatus and a computer readable medium storing processor executable instructions for identifying the significant event, the instructions comprising steps of:~~

~~receiving the data signal; and~~

~~generating from the received data signal at least one processed signal indicative of a multiple of a standard deviation.~~